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TGOSTCACTGCAGG000GGG00GGGGTGTGTTTCCACCTGGAGGTTGCTGACACCTGTG00CTGGGCTGACTTC
CAG00GGTGGCACAGAGGCTCCAGGGGGCAGCACTCAAGGCGATCTTAGGAATGACAGAGTTG0GT00CTCTCTGTTG
CCAGGCTGGAGTTCACTGGCATGTTCTTAGCTCACTGAAGGCTCAAAAT0CTGGGTTCAAGTGAC00CT00CA00CTCAGC

	M K I K A E K N	8
0CCATGAGGA00CTGGGACTACAGGACACAGCTAAAT00CTGACA0GG	ATG AAA ATT AAA GCA GAG AAA AAC	24
E G P S R S W W Q L H W G D I A N N S G		28
GAA GGT OCT TOC AGA AGC TGG TGG CAA CTT CAC TGG GGA GAT-ATF GCA AAT AAC AGC GGG		84
N H K P P L L V F I V C L L W L K D S H		48
AAC ATG AAG CCG OCA CTC TTG GTG TTT ATT GTG TGT CTG CTG TGG TTG AAA GAC AGT CAC		144
C A P T W K D K T A I S E N L K S F S E		68
TGC GCA CCG ACT TGG AAG GAC AAA ACT GCT ATC AGT GAA AAC CTG AAG AGT TTT TCT GAG		204
V G E I D A D E E V K K A L T G I K Q M		88
GTG GGG GAG ATA GAT GCA GAT GAA GAG GTG AAG AAG GCT TTG ACT GGT ATT AAG CAA ATG		264
K I M M E R K E K E H T N L M S T L K K		108
AAA ATC ATG ATG GAA AGA AAA GAG AAG GAA CAC ACC AAT CTA ATG AGC ACC CTG AAG AAA		324
C R E E K Q E A L K L L N E V Q E H L E		128
TGC AGA GAA GAA AAG CAG GAG GCC CTG AAA CTT CTG AAT GAA GTT CAA GAA CAT CTG GAG		384
E E E R L C R E S L A D S W G E C R S C		148
GAA GAA GAA AGG CTA TGC CCG GAG TCT TTG GCA GAT TOC TGG GGT GAA TGC AGG TCT TGC		444
L E N N C M R I Y T T C Q P S W S S V K		168
CTG GAA AAT AAC TGC ATG AGA ATT TAT ACA ACC TGC CAA OCT AGC TGG TOC TCT GTG AAA		504
N K I E R F F R K I Y Q F L F P F H E D		188
AAT AAG ATT GAA CCG TTT TTC AGG AAG ATA TAT CAA TTT CTA TTT OCT TTC CAT GAA GAT		564
N E K D L P I S E K L I E E D A Q L T Q		208
AAT GAA AAA GAT CTC CCG ATC AGT GAA AAG CTC ATT GAG GAA GAT GCA CAA TTG ACC CAA		624
H E D V F S Q L T V D V N S L F N R S F		228
ATG GAG GAT GTG TTC AGC CAG TTG ACT GTG GAT GTG AAT TCT CTC TTT AAC AGG AGT TTT		684
N V F R Q N Q Q E P D Q T F Q S H F I S		248
AAC GTC TTC AGA CAG ATG CAG CAA GAG TTT GAC CAG ACT TTT CAA TCA CAT TTC ATA TCA		744
D T D L T E P Y F F P A F S K E P M T K		268
GAT ACA GAC CTA ACT GAG OCT TAC TTT TTT CCA GCT TTC TCT AAA GAG CCG ATG ACA AAA		804
A D L E Q C W D I P N F F Q L F C N F S		288
GCA GAT CTT GAG CAA TOT TGG GAC ATT CCG AAC TTC TTC CAG CTG TTT TGT AAT TTC AGT		864
V S I Y E S V S E T I T K M L K A I E D		308
GTC TCT ATT TAT GAA AGT GTC AGT GAA ACA ATT ACT AAG ATG CTG AAG GCA ATA GAA GAT		924
L P K O D K A P D H G G L I S K M L P G		328

FIG. 1A



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TTA CCA AAA CAA GAC AAA OCT OCT GAC CAC GGA GGC CTG ATT TCA AAG ATG TTA OCT GGG 984
Q D R G L C G E L D Q N L S R C F K F H 348
CAG GAC AGA GGA CTG TGT GGG GAA CTT GAC CAG AAT TTG TCA AGA TGT TTC AAA TTT CAT 1044
E K C Q K C Q A H L S E D C P D V P A L 368
GAA AAA TGC CAA AAA TGT CAG GCT CAC CTA TCT GAA GAC TGT OCT GAT GTA OCT GCT CTG 1104
H T E L D E A I R L V N V S N Q Q Y G Q 388
CAC ACA GAA TTA GAC GAG GGG ATC AGG TTG GTC AAT GTA TOC AAT CAG CAG TAT GGC CAG 1164
I L Q M T R K H L E D T A Y L V E K M R 408
ATT CTC CAG ATG AOC CGG AAG CAC TTG GAG GAC AOC GGC TAT CTG GTG GAG AAG ATG AGA 1224
G Q F G W V S E L A N Q A P E T E I I F 428
GGG CAA TTT GGC TGG GTG TCT GAA CTG GCA AAC CAG GGC CCA GAA ACA GAG ATC ATC TTT 1284
N S I Q V V P R I H E G N I S K Q D E T 448
AAT TCA ATA CAG GTA GTT CCA AGG ATT CAT GAA GGA AAT ATT TOC AAA CAA GAT GAA ACA 1344
K M T D L S I L P S S N F T L K I P L E 468
ATG ATG ACA GAC TTA AGC ATT CTG OCT TOC TCT AAT TTC ACA CTC AAG ATC OCT CTT GAA 1404
E S A E S S N F I G Y V V A K A L Q H F 488
GAA AGT GCT GAG AGT TCT AAC TTC ATT GGC TAC GTA GTG CCA AAA GOT CTA CAG CAT TTT 1464
K E H F K T W 496
AAG GAA CAT TTT AAA ACC TGG TAA 1468
GAAGATCTAATGCATCCTATATOCAGTAAGTAGAATTATCTCTTCATCTGGGAOCTGGAAATCCTGAAATAAAAAGGA
TAATGCAATAAACACAGTTGCAGGAAGTATGTTAGCTATATACTATGAAGTACTCTTAGTTTACTTATGTTCAATGGC
TTAGCTATTAATACTCAAAATTGAGTTAAATGAAAATTOCTOCTTAAAAATCAAAAGTAATATGTATTACATTTTCATG
GTACATTAGTAGTTCTTTGTATATTGAATAAATACTAAATCACCTA

FIG. 1B



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TGOGTCAOCTGCAGGCGGGGCGGGGGTGGTTTCCAOCTGGAGGTTGCTGACAOCTGTGCOOCTOGGCTGACTTC
CAGCGGGTGGGACAGAGGCTCCAGGGGGCAGCACTCAAGGGCATCTTAGGAATGACAGAGTTGGGTCCCTCTGGTTG
CCAGGCTGGAGTTCACTGGCATGTTCTAGCTCACTGAAGGCTCAATTOCTGGGTTCAAGTGACCOCTCTCACTCAGC

M R T W D Y S N S G N M K P P L L V F	19
CCG ATG AGG ACC TGG GAC TAC AGT AAC AGC GGG AAC ATG AAG CCG CCA CTC TTG GTG TTT	57
I V C L L W L K D S H C A P T N K D K T	39
ATT GTG TGT CTG CTG TGG TTG AAA GAC AGT CAC TGC GCA CCG-ACT-TGG AAG GAC AAA ACT	117
A I S E N L K S F S E V G E I D A D E E	59
GCT ATC AGT GAA AAC CTG AAG AGT TTT TCT GAG GTG GGG GAG ATA GAT GCA GAT GAA GAG	177
V K K A L T G I K Q H K I M H E R K E K	79
GTG AAG AAG OCT TTG ACT GGT ATT AAG CAA ATG AAA ATC ATG ATG GAA AGA AAA GAG AAG	237
E H T N L M S T L K K C R E E K Q E A L	99
GAA CAC ACC AAT CTA ATG AGC ACC CTG AAG AAA TGC AGA GAA GAA AAG CAG GAG GGC CTG	297
K L L N E V Q E H L E E E E R L C R E S	119
AAA CTT CTG AAT GAA GTT CAA GAA CAT CTG GAG GAA GAA AAG CTA TGC CGG GAG TCT	357
L A D S W G E C R S C L E N N C M R I Y	139
TTG GCA GAT TCC TGG GGT GAA TGC AAG TCT TGC CTG GAA AAT AAC TGC ATG AGA ATT TAT	417
T T C Q P S W S S V K N K I E R F F R K	159
ACA ACC TGC CAA OCT AGC TGG TCC TCT GTG AAA AAT AAG ATT GAA OGG TTT TTC AGG AAG	477
I Y Q F L F P F H E D N E K D L P I S E	179
ATA TAT CAA TTT CTA TTT OCT TTC CAT GAA GAT AAT GAA AAA GAT CTC CCG ATC AGT GAA	537
K L I E E D A Q L T Q M E D V F S Q L T	199
AAG CTC ATT GAG GAA GAT GCA CAA TTG ACC CAA ATG GAG GAT GTG TTC AGC CAG TTG ACT	597
V D V N S L F N R S F N V F R Q H Q Q E	219
GTG GAT CTG AAT TCT CTC TTT AAC AGG AGT TTT AAC GTC TTC AGA CAG ATG CAG CAA GAG	657
F D Q T F Q S H F I S D T D L T E P Y F	239
TTT GAC CAG ACT TTT CAA TCA CAT TTC ATA TCA GAT ACA GAC CTA ACT GAG OCT TAC TTT	717
F P A F S K E P M T K A D L E Q C W D I	259
TTT CCA GCT TTC TCT AAA GAG CCG ATG ACA AAA GCA GAT CTT GAG CAA TGT TGG GAC ATT	777
P N F F Q L F C N F S V S I Y E S V S E	279
CCG AAC TTC TTC CAG CTG TTT TGT AAT TTC AGT GTC TCT ATT TAT GAA AGT GTC AGT GAA	837
T I T K M L K A I E D L P K Q D K A P D	299
ACA ATT ACT AAG ATG CTG AAG GCA ATA GAA GAT TTA CCA AAA CAA GAC AAA GCT OCT GAC	897
H G G L I S K M L P G Q D R G L C G E L	315
CAC GCA GGC CTG ATT TCA AAG ATG TTA OCT GGG CAG GAC AGA GGA CTG TGT GGG GAA CTT	957
D Q N L S R C F K F H E K C Q K C Q A H	335

FIG. 2A

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ACATTTTAAAGCTACTTATAGTCCTTGGAAATAGCAACAAATATCTTAGTTATTGGACTATTATTAACCTTAGTCATCTTATTACTGCTTG
ATTATGAGACACTCTCCCTGCTAATCCTTAGAACATCTTGGTTCTTGGTACTTGACTTTTAGCCCCCTCTGACATATAGTTGATGTCAGA
CTGCTCGGCATTTTCAGTAGTCTCTAATTTTACAAATCCCAATAAAGTCTGCTCCACTGTGGCTTGTATTGCTGTTAATACTGCTTGTGTTTC
TGTTATAAATTTATTTTGTGCTTTGGAGTAAGATATCATCATTTTGGCATAGCTACAAATCTGAAGTTAAAGAAAATTTTAAAAAATGTAAT
TGTGGGAAAATAACAAATAGATCTGCTGAGATGGAGGCTTTGACTAATGTTTAAATAACAGGCAACAAAACAAAGAGCGAGGATATTTT
GGTCACAACTAAACCTAAATTAATCTCTCATACAAAGCCCCATTAAAGATAAATGCTCAAAATTCCTGGGAACATTTTCACTTGTGCTTTC
CAATTTTACCTTTCAGAGGGGTGCTGATCTAATCAGGGGAACAAACTAACCTGCTGGCTTAAATTCATTAACAGGGACTAATTTGTCAAAAG
CGGCAGTACTAGCTGAAGTGAATGGGTATGGAAGCATTCATCTGTGAGGATTTTGTCTGAGGTGCTGCGACAGGGTAGGGGAACCTCACCCCA
GGCTGCAAGATGCTAACAGTTTCAGGTTCAAGGTTCTTAGTGTGACTAAGGTGCACTCAGGATGGGAACAGGTGCAACTTGGGGCCAAACAT
CAGTATGAAGGGCCTGATCTGAGGGCAGGGGAAGGAGGGGCAATCTGCGGAAAGCAAGATTCTCTGTTCTGTTGACAGAGTCTTGG
CCCAAGGATCAACGTTAATTAAGTAGAAATACCAAGAAACAAAGAAAGTTGGCAGAACTAGGAGAAGCAGAGTCTCAGGCCAACTGG
ACTGGGCTCAGCCCTTGGCTACTGGCCCGGCAGATGATAGAGAGAAACCCAGGCTGAAGCCAGTGGTTGGGCTGGCCACA
CACCATGCTAGCCCTTAAAGGGGTGGCTAAGGGCATGGTCCGCTCCAAAGAAAGGGAAGGGGGCCCCAGAAATATTTCTGAATCCCCACTC
ACTGCCAGGGAGAACTCTCAATTCACCTCAATAGTGCATTTCTCTGCTTCTCAATAGGCTAATCTCTAGAGAAATATGGGGACAAAGGG
GAGGAGGTCTAGTGGAAACAGGTCTAACTGGGCTTGAATTTTAAAGATAAGTTAAATCATACATTTGGCTGGGTGAGCCCATGTCTCTTAG
TCTTTACAAAGTAGAACACAAATAATTCAAATGGAAATCTACAGACACCTATTTTGCAGATGAGGAACACAGGCTATGAAGATTGGGAA
GATTGGGAAGNACTGGCCAGGTGTGTGCTCAGCCCTGTAAATCCAGCACTTTGGGAGGCCGAGGCTGGTGGATCACTTGGAGGTCAAGGA
GTTGGAGACCCAGCCTGGGCAACATAGTAATAACCCCTGTCTCTACTCAATTAACAAATTCAGCAGGGGCTTGTGGTGGCCACCTGTATC
CCAGCTATGCAAGGCTGAGGCAGGACAAATCACTTGAACCTGGTAGGGGAGGTTCAGTGCAGCCAAATCAAGCCACTGTACTCCAG
CCTGGGTGACAGAGCAAGACTTTGTTTAAATAAATAAAGGAAGAACTAAATAATGTAATTTCAAGGGGCTATCACAATAATGGT
CCCAATAAAGAGAAAGCAGGACTCATGTTTAAAGAAACCCATGAGATGTGTATGGACCTCATGGAAGAGCTCTTGTCTTCTAATGATCTA
CGTAAACAGATGAAGAGCAGAGCATAGGGCTAAGGATGAAATAACACAGTAATAAGGTATTAATATATATTATTAAGAAAGCTAATGCTCC

FIG. 3A



A C A T A A G C A G A G G A C A T T A A A G G G A C T T T T T T C T T A A G G A T A T C T T A A T G T T T T A A A T G A G A A G A C A T A G A A A G G G A T A G G T C C A A C
 T C T T G G G A T T G T T C A G A G T T T C C A T C G G A A G C A C T C T G A G T C T G A G A T T T G T A T G C A G A A A A T T A A T T T G A A T G T G C T T T T T C A G A
 T C A C C C A G G T G G G G A G G A G G A A C C A G G A C T G G G C A G A G A G G C T G G G C T G T A A C C A A G T C A C A A A A G G T G T C A G C T G G T C C C A
 T G T G T A A T T C T G G A C C T A G G A T G G C T G A T C C C A A G G C A T T C C A A A C T G G G C A A G G A A G T T G T G C T T T A A A C T T C T C A T T G A C T G T C A
 G T C A C T G G G C A T G A G C A G T C C C A G G A A G G G G G A T G A C C T T G A G C A A G G T G G A T G T C T T C A G C C A A G G G C A A Y C A C T G G G A A A G G A A
 C C C A G C T A T A A A C T G T C A G C T G C C A A C A C T C C C A G C A T C T G A G A G G A T G A G G G C T T C A A T T C T A A G G G C A G G G C T C C A A G G G C A G G G
 T A C G G A T G G T G G A A T C T G G G C A G T A C C T T G T G G C T T C C A C T A C A G T C C A C C C C T T G C A C C A C T T A G T T C C A C T G G C T T T T T T T T T T T T
 T T C T T T T T C T G A C A G A T C T C A C T C T G T C A C C C A G G C T G G A T G C G G T G G C A C G A T C T C G G C T C G T C C A A C C T C G C C T C C C A G G T T C A
 A G C A A T T C T T G A A C C T C C T G A T A G C T G G A C T A C A G A T G T G T G C C A C C A C A C C C A G C T A A T T T T T T T T G T A T T T T T T A G T A G A G A C G G G T
 T T T A C C G T G T T A G C C A G A T T G T C T C G A T C T C C T G A C C T C A T G A T C C G C C T G C T T T G G C C T C C C A A A G T G C T G G G A T T A C A G G T G T G A G
 C C A C C G C A C A C A G C C A G A T C C A C T G G C T T C T A T A T A A T T T C T G G T G A A G C T A A T T C A G G A T T C T G A T G G A C C T G T C T T C C C G A G G G A A
 A C T T G T A A A A G G A A G T T A G A G G G A C A A A C T A T A G C C C T G C C A C A G C A G C T G C T G T C G A G G A C A A A A A T G T G T C T C C T C A T T T T C C C T T
 A A A C A C C T G A C C T A G A T T C C C C T A A C C C T T A G T G G G C A C C T C T G T G G A T G G A A G T G T G G C T C A C Y K G K G G R W K R W Y C M R R W Y Y C W Y M
 Y C C C T G A G T G G T C T G A G C T C C C A G T T A C C A G G C C T T C T C A G G C T G T G G C T G T T G C A C T T A C C T C C C A G C C A T C C C C C A C T T T T T T T T T
 C T T G A G A C T G G G T C T T G C T C T G T C A C C C A G G C T G A A T G C A G T G G C A T A A C C T C A G C T C A C T G C A G C C T T G A T C T C C C A A G C T C A A G C C
 A T C T T C T C A C C T C T G C C T C C C A A G T G G C T G G A C T A C A G G C A C A T G C C A C C A T G C C C A G C T A A T A T T T T T T A T T T T T T T T T T T T T T T T G T A
 G C A A T G G G A T T T T G C C A T G T T T C C A G G C T G G G C T T G A A C T C C T A A G C T C A A G C T A T C C T C C C A C C T C T G C T T C C C A A A G T G C T G G G A T
 T A C A G G C T T G A G T C A C T G C A T C T G G C C A C A T T T A T T C C T T T T A A A C G T T A A A T T G A A T G C A G G A T C A C T G A G A G A C A G G T G A G T G A T T
 A C C A G G G T G C C A A A C A T A C C C T T C T C C T T C T G C A G C T C T A C C T C C T C T G A T G A T C A G G A C A A T C A T G A T G A T G A T G A C T C C T T T T C
 C T T G A C T G C T C T C T C A G A A G G A A C C A A T T G T G T T G G G T G A G A A C A C A T C A T T T T G A A A T T T A G T A G A C T C T T G C T G T G C C C T A T G G T
 A G A A G C A T T C C C T C T C T G G G G C C A A G A T C T T T A A T G C A C A G A G T C C A A A G T C G T G G G A A C C A A A G C A G A A A T T A A A A A G G A G A T G A C T
 G G G A T T A T G G T A A G A A C T G T T T T C C A C C C T T G A T T T G C T G C A C C C A T G T G T T C T A C C T A G G A G A T A G C A C C A T A T A C T A C T G G T T A T T C A T
 T T G G A T T A C A T G C T G C A T C C C G G A A A T G G G C A C T G C A T T C A C T G G T C A T C A T G T C A G A G C C T G C G T G C A G A G G C T T T C C C A T T G C
 T C T G T C A G T G T T A T A G G G T C A G T G G A T T T C A T G G T C A T G T G C C C A C T G C T G C A C C T C C A T T C T T G T A A A A T G G G T C C T C T G G T T C A A
 T G T G A T G C C A T G T G G A T C T T G T C A A T A G A A T A A T A C T C A G A T G T T C T G G C T G A A G C T T T A C A G C A G A A A A G G C C A A C C G A T G A C

FIG. 3B

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TGAAATAGCGTTGAGCCAGTCAGATGAGTTCTCTTTCCAGGATAGACGGAGTCTAGTGTAGATCACTTGTGACATCAAGAGACT
GGCTGGTCTCTTGAGGATGGTGCTGTTCTGCAATTCATCATCTTGTGATGAATGAGGGACCCCTGCTATTGGGCTCATGTACAGCCCCCA
TCTCTGCCACAATGAGCGCTCCATTTCATGTTCTCTATTGTGCCAACACTAGGGTGTCTGTAAATCACTGCACTGAAACAATTAATTGCTATCATTTAT
TATTATTTTTTTTTTTTGTAGACAGAGTCTCGCTCTGTGCCAAGGCTGGAGTGCAGTGGCAGCATCTCAGCTCACTGCMACCTCTGCGCT
CCCCGCTCAAGTATTTCTCCCGCTCAGCCTCCAGAGTAGCTGGGATTATAGGCATGGGCCACCAACGCTGGCTAAATTTTTTGTATTTTT
TAGTAGACAGTCTTTTTGGCATATTAAGTCTGTCTCGAACTCTGAACTCTGACCTCAGGTGATCTGCCCGCTTGGCCCTTCCGGAGTGTCT
AGGATTATAGGCGTGAGCCACCACCTTGTCTATTATTATGTGTGAGAAAACTGTTTTTCAAATTAATAAAGAAAAAATAAAGATTATATTTT
TGCTTTTATTCCTCTAATGCTGTTCTTTAAGTAGATGTGAATTTCTGAACTACATACTTTTTTCTTTTACTCTTGAGAGGTTGTTTGG
AGGTTCCAGCAGGGGACCACAGCTACTCGTATACCTTTGACCAAGAGACTGGTCTTGTCTATCAAGGATGGTCTCTTTCTTCCACCAAG
CACACAGCTTCTGGAGGGACGCACATGGAGTGGTGAGGAGGAAAGGGGACACCCGCCCTAGCCAGCTAGATCAGCCAAAGCAGAAATAAACC
CTGGTAGTCAATGGGGTGACAGTGTGCAGCCAGATTGCOCTCACATCCAACTCTTTAGTGATCTTCTCTTAACATTTCTTGCAAGGCAG
GTCTACTGGTACAATTCCTCTAATTTTTTGCTTGTGTTTGAGAAAGTCTTGTCTTCACTTCTTCACTTCTTCACTTCTTGGAGACAGAG
TCTCOCTCTGTGTCAGGCTGGAGTGCAGTGGGCTGATCTTGGCTCACCTGCAAACTCTGCTCCAGGTTCAAAGTGATCTCTCATTTCT
CAGCCATCTGATAGCTGTGGTTACAGCGCTGTGCCACCATGCCCTAGCTAAATTTTGTATTTTTTAGTAGAGACGAGGTTTTTACCGTGT
GGCCAGGATGGTCTTCAGCCTTCTTAACTTTTAAAGGATAATTTTACGGGGAGAAATCTAGGTTAGTGTATTTTCTTTCAAATACCTTTA
AATATTTCACTCCACTTCTTCTTGTGTTGTTCTGAAGATAATGATATAATCTTATTTCTTGTCTCTGAGGTAAAGGTGGTTT
CATACCTCTGGCTTCTTTOGAGAAATTTCTCTTTGCTTTTGAATTTCTACAGTTTGAATATGATATAAATATGATATAGACTTGGGGCTAT
TTATCCTTCTGGTGTAGTCTGAGCTCCCTAAAGTCTGGTATGGTGTCTTGTAAATTGATTTGGGAAAAATTTCTCAGTCAATTATTTACTTC
AAATATTTCTTCTGTCTCTTGTGTTTTTTTTTAACTTGTGCCAACTTTTAAATTGATACATAGTATTTTACATATTTATGGGGTACATGT
GATACCTCATTAACCTGCATAGAAATGTGTAAATGATCTAGTGAAAGGTGTTGGACTATTACCTTGAGTATGTATCGTTTCTATGTGTGG
GAGCTTTTCAAGTCTCTTGTAAACAATTTTGAATATACAATGCTTGTGTGTAACTAGTCACCCCTGCTCTGCTCTCAAAACACTAGG
ATTTATTCCTTCTGTCTAACTGGGTGTTTGTACCCATTAAACCAACCTGTCTTCATCCCTCTACCCACATACCTTTTCCAGCCTTGGGT
ATCTATCATTTCTACTCTTTTACCTCCATGAGATCAGCCTTTTTTAACTCCACATATGAGTGAGAAACATGTAGTACTTGTGTTTGGCGTGTCT

FIG. 3C

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FIG. 3G

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AATAGTACATTTGACAGAGAAATTTGGGGAATCAAAAGTCTGTGAGACCAGCAAGATAAATAAGGCAAAAGGATACAAAACCATATCCAA
AGAGAAATGGTTTAAAGGAACTAAGGCTGTTTCTCTAAAGAAATAAGTTGGAGACATGTGACCTCCAAAGAAACAGGACTTTTCT
ATGGGGCTCCAAGGGGTTTCTATGAGAGAAATGATAAAGGAGAGATTTTCAGCTTAGTCTCAGGAAGACTTTTCAACAAACCTGCCC
AAAGATGGA CTGCCCCTGCTAAGGATTTGTGTTCTGACATTAAGGGTATGGAGGTATGGGTAGATGAATAATTTTACCAAAATGCCATAG
ATATTTTCAGGCTATTGATGTTGTAATATCATACTAGGCAACTCCACTTCAATATGAGTCTCTATGATGTAAATGAAATAGGATGTGTT
TCGATAGAGAGTTGCAGATTTTCAATTTTGAAGTTAGCGACCAACAAATTAATTTTCCCTACATAAGAAACATGTTATTACTCTAGTTGAT
GATGACTGCTTATGGGAAATGTCTCTGCTTTGTTAGGAATCTTTGCCCTAATATATGTATAATTCAAGATGGTATTATAAAGTGACATATA
TGATTTTAA CATTTGCACTTAAATAA CACTTATTCTGTACCATGMASTGTCTAGGAGCTTCTACATAATTCATTATTTATCTTTATTTT
ACAAAGACAGGGAACTAAAGGCATGGAGAGATTGAGTAATTTTGTGCAATATTAACTTCTAGTAAGTGTAAAGGAAAGATTGGAAACCCAT
TCTGGCTCCAGGATCCAGGGCTCAAAGCCAAATATACTATCCACCAACCCCAACTCTTTAGTTTGTATCAATTTGTCAAAATTTATTACAGTT
ATTTATCTGTAAATTAAGGGGATAAATGGCCAGTCAATAAATGTGTGCTCCCTTCAAAGGTTACATACTTAACCAATGGTGCTACTGGGCT
CAGAACATTTTGGAACTACGATTTTGGTGGCAACCAAAACCTCCAGTACATCTCTGAAACATTTCTCCAGAGGCAAGTCTTCTTCC
ATGGAGACTGGGCTTCAATTTTGTAAATAGCCTGAAAGTTGTTGAGGTCAAACTCTGATGAAAGAGCGGCTGGGGAAGCTGGATATTTT
CGTTGCTGATTTAAACAGTAAATGCCACCTAAATGAGAAAGGCTACTTTCTTTTGAATGTTTGTAAACTGGCTTTTGAAGGTACTTCTTT
AAAAAGAAAGCACAAAGAACGCTGACTGGCAACAGCCTCAGTGAATACTCTTAATCATCAAGGCAACCCACACTCATTTGGATG
TGTGCATCCGGTGAATGTTATTTTAAAGTTATGTGCCACAAAGATGCAATTTTGTGCTATAACAAAGAGCTGTTGTAAATTTATAA
AGATAA AAAAGGGGAAAGGAGAAAGGCAACCAATGGAAAGATTTCTTAGGCATTAAGTGCTCAGACAGCATAGATCTTTCATTAGATGAAGT
CAGGGAGAAAGAGACACAGACTTTTGCCATCTCAGGTAGAAAGTATCAAAAGTCAATCAGCCTCCTAGTAAGACAGACAGCCTGGGTTTGAAGCTCT
GCACAGCCATTTCCTAGCTGCTGGGGAAATAATTAATTTCTTTGAAGCCTCAGTGTCTTTATTTTGTAAAGTAAGTGAATATATTAACCT
TGTCAAGGATGTTGTCAGAAATTAGAAATAATTTAAAGAGGTCCAGCACGAGCAGGTCAATCAAGGGAAGATGTTAAATAACAAACAGGT
GAAATGTACTCCCAAAAGATAAAGTGGATACATAGATGAATCTTCTCTCACACAGAGTATAATAACCTCAGAAATAATTTGCCCTAGAG
TAAACATGCTCTCCCAAGCCAAAGTTCATCATCCAGGAATACGGAGAGGATGTTTGGGATATGCGGGGCAATGAATTTTACAAATTTGATAGG



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FIG. 3K

CAATAGGAAATAAATTATTGAAATAGAGGAAGAGACAGGTAAATAAGGTATACAAAGTAGAATGGGGCAATAAATGGCGCATTT
TGGCACCATCAAGAGTGCCCATGTAAACAGAGATAAGTAATGCAATCTTGAGCTGAACACTGAAGGATAAGAAACAAAGGGGAGAAAGAC
CTAGAAGGGGCAATATACAGCAAGGAGGAAATAAATACTCTGTGCATTCATGCCAGTCTTAGCATTTAGGACATCTGGAAGCTAGAGG
TGGAGTGGAAAGAGGAGAGTGTATAGGAGCTGGGGTTCAGAGAGTTTTCAGGGTGGGGAAGGTCTTCGACGAGCCTTGTAGGTAATTGTAA
GCATTTGGGATTTTATTCTGAGGGTCACTGGGGTGTCTATTAGAGACTTTTTCAGGCAAGAGGTACATGCTCTGACTGAACCTTTATTCTCTGTG
AACAAATCAGAAATCAACTAGATGGATTTAAAGTATGGGTATACCATGAAAGAAATTTACTTAAGATCCTTGCTACTCAAAAGTATGAGCCAG
GACCAGCTACACTGGCATMAGCTGGGAACTTTGTTAGAAATGCAGAAATCCCAAGTCCCGAGACAAACTGAATCAGAAACCTGCACTTTAA
CAAGATCCAGGTGGCCCATTTGTATGGTAGAGTTTAAAGAGCATTTGGTTTAAAGATCCCTCTTGATAGAGCATGGAAAGATACATTT
GAGACAGAAATAGACAAGTCAGAGACAGGTGGGAAGGGCCATAAACAAGGCGCAGAGTAGGGAGGTAAATGAGGAGACAAATACAAAGGAA
GAAATGCACAGCACAGTGTAGACAAATTCCTAAATACTTAAATAAATTTTGTGAAATTAATGATAGATTCAAGAGGTTGCAGAAAGAA
ATGCGTAGGGAAGAAACAATGCCACCTTTTACCCAGCCTCTCCATCAATTAACATCTTATGCAACTATATTAATAATATCGAAACAAATCAA
GTGACATTTGCTACAAACCATAGAGCTTATTTCAGATTTCAACAGTTATTAGATGCACTCGTGTGTGTATGCAATATAGCTCTGTGTAAAT
TTTATCATATGTGAAGCTTTGCTACCAATCAAGATATTCAAGCCATTAGCAGAGATTTTCTGTGTGTACCTCTTATAGCCACACG
CATTCCTCATTAACCCCTGGGAACAATACTGTTCATCTCTATAATTATTCTATTTCACGAAACATTTTGTAGATGGGTACATG
CAGTGTGTATCTTTTGGGATTTGGTAACAGAGCAAGACAGGATCTCACTGTCAACCCAGGCTGGAGTGCAGTGTCTGTGATCTTGGCTCA
TTGCAGCCTCCACCTCTGGGCTCAGGTGATCCTTCCACCCAGCCTCTGAGTAGCTGGGACTACAGACACACGCACTCAGCCTGGC
TAATTTTGTATTTTATATGATGGGTTTCAACATTTTGGCCTAGGCTAGTCTAGAACTCCTCGGCTCAAGTGTATCCAAACCGCCTTG
GCCTCCCAAAATGCTGGGAGTACAGGCATGAGCCACCACTCCACAGCTTTTTCATTCATACCTTTCTTTGAAGTTTCATCCAAAGTTGTG
TGATCAATPACTTCACTCCTTCCAGTTGCTGAGTAGTATTCCATGGCTTGGAGTGTAGAGTTTATTCATCACTCAATTCAAACCCATTTGAA
GGMCAATTTGGGTGGCTTCCAGTTTCCAGTTTGGGCTATTATGAACAAAGTTACTATGAACATTCATATACAAATGGATACTTTTTTGT
TGAAATGAATGGAATGGAATGGAATGGAATTTAGTGTATCAGCTATGTGGGATGAAGAGTGGCATAAAGTAGTAAAGTAACCCCTCAATGCA
ATGTGCAGCCAGCAAGTACCAACAAAAGAGTTTATTGTGTTTCATACATATATTTCTATATATACATACACACACTTTTATTAATAACCA
AATAGTATCCTTTTCAATGAAAACAGTAATTTAAACATAAACTATGAACCTTAAACTTAAAGTAAACTTGACAAACAGTGTGTCAGAAAT

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FIG. 3L

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TTTTTGTCTCTAGGTCAGTTAGGTCCTGTCTCTTATCTTATGACCAGGAAGAACTAGGTACCTGACATCAAAAGAAATGAGTGGCATAG
AATTTTATTAAGCAAAAAGGAAAGCTCTCAGGAAAGAGTGGGGTCTGAAAGCAGGTTGCTGTTGCCCTTTCGTAGTTGAATACAAGGG
CTTCTATATAAAACCTGATGGGGCCGAGTTCCCTGTTCGTATAAAGCATGAATTCCTGGTGGCTCCACCGCCCTCCCCAGTGGGTATG
TGGGACCTTCCTGCCACTAGGGACATGTATTAGACAAGCTCCCTGTGCACTGTTCCCTTATCTGCACAAAACATGGGTTGGAGGTTCTCCGG
GGACCCCTTCCTTTACTTTCTGCCCTAAAGCAAGCTGGCTAACTCCTTTCAAACAATACTAAAGACATACAGACAATGGTTCTCAGTACAAAT
CAATTTAAATAATTTAAGTAAACCTTAAATGGTGTGTTGATTTTGACATTTTAAAGATATCGCTGTTCTTCTAAATAATCTGTGTTTTT
AGTTGTTGGGCTCCTATTCTCAAAATGTGCTATTACTATTAAGCATTTCTGTATCATGGCATTCCTCAATAATAGTTTAAATAATTAATTTT
AATTTGAAGAAAGGAAACATTTCTGTACAGTCACGGAAAGTGTCAAAAATGAATAATGAGGCAGGGTGTGGTGGCTCAGCCCTGTAAATCTCCG
CACTTTGGGAGGCCCTAGGTGGGTGGATTGCTTTGAGCCCTAAGAAATTTGAGACCAAGCCCTGGGCAATATGTTATTAACCTGTGTGTACAAAA
AATACAAAATTTAGCCAGGTGTGGTGGCCCAAGCCCTGTAGTCCAGCTACTTTGGGAAGTTAGGGTGGGAAATCTAGGTGACAGAAATGA
GACCTTGTCTCAAAAATAAAGAAATAAAGAAATGATAAAGGATACATATCAGGAAACATGCAATGCTGTTATTTGTATCATCTACTTTA
GAGTAATTTCCAGTATAGTGGTTTTTTTGTGTGTTGTTTTATTTTGTAGAAAGGGTCTTGGCTGTCAACCCAGGCTGGAGTGCAGTG
GTACGATCTTTGGCTCACTGCAACCTCCGCTACCAGGTTCAAGCCATCTCTCCCAACTCAGCTCCAGAGTAGTGGGACTACAGGTGTG
CGCCACCAATGTCCAGATAAATTTTGTATTTTTTTGTAGAGATGGGATTTTGGCATGTTGGCTGAATGCTGGCTCAAGCAATCCACCCCTC
CTCAGCCTCCCAAGTGTCTGGGATTCAGGGCTGAGGCCACCAACACCCAGCCCTCAGTGTAGTGTGTTTTTCTTTTCTTTTCTTTTCTATG
TTTTTAATGAATTTTACAGTTACCCAAATGTTTCCCTAGTTTTTCTGCTTCCAAAGATCACTCTGGAAGAATATTTAAGAAATATATACCAAT
AAGAATATGCAAGTCTCCCTAAGGGTGGCAGGAAGAACACCCCTCCCTCCAGATGGTATTTAGGCTCTGCTGGGAAACGGCTTCCC
CATGCTCCTAGGTCAGGTCCTCTCTTTGGCATGACACTACCAACAGTGCAGACCCCAACAGGGAGAAAGGACGGCCACAGTCCCTCA
ATCCCCCTTTTCCAAAGATGTGCACAGCCCTGACTCTCTAACTCTCCCACTGACTCTAGGGGAAAAACAGCAACAGGGCAGGAAACGATTT
TCCATGTCAACCAACCTTTCTCTGTGAGGGAAACCTACTGAGCCACCTCTCTTTAGGACCAAGCCCATCTGTCCCAACAGCTGGAAAGTCCAGCTTC
CGTTCAAAATCGGAGTTCTTTCTTCTATGACATTTCTTTGCAAAAGTCCCGGAAACCCACAGCTCTGAGACTCTGGCTGTCCCCCAACCCACCC
CCATCTCTCTGTCTCACCCCTGGTCAGGAGAGGCCAAACATCAGTCAGCTTCCAGTAAATCAAGCCCTGGCTTTCTCAACCCAGGCT
CGCCCCAGAACCAACCGGCTTCTTTTCAGTGTAGCCAAAGGCTATTGGAGTCTCTCTCAAAATGAAAGAGATTTTATCAAAAGGCTTGA
GAAGAAAGAAAGAGGATTTATATAATAAAGCTAATAAACAACAACATATACACAAACAAATAAATAAACGTGAGATATGATTTCTCCCC

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FIG. 3Q

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GAAAGTGMCCGGWTTCAATGAAGTATTGCTTAAATCTTAAGAACAAAATGGCAGCTGTGAAAAACAGATGAAGTAATTAGAGGAAGAGCC
TTTTTGGAAAGCTTCGAGATATTTTCAAAGTAATTAGTACTAGTTAGCAATAAAGTTCTGTCTGAGAAATTTGCTCTTAAAGGAGGAACA
TGGATTAAAGAAAAAATCTGCTACTAGGAAGTAAGCCATCTTCTATGTGTGTGATGTTGGTTTGTCTTCTCTGAAAACTGGTTCGGTTTTT
CAACAAAATTTGGGCTCTGTTGAAAAAGAACACCGCAGATGCCAGCCTTGATGTCAAAACGGGCCCAAACTTGGACAGTGGTAAACTTAATGA
GCAATGGTGCACAGAGTCAGGGTAAAGCTGGACAAATTTCTCTATGACCAACTTTTCCAGGACTCTGCTCTGCTCTCTCTCTGAGAAAAATA
CCCAAGTGTGCTCTCTTCCATTTGGCCCAACCATGCACTCTTTCAGGATAGGMCACATCTGTTTATAGGTGTGGATTTGTAGTTGCTCATTA
AGTGACATTAGGCTGTTTAAAAATAATAATAGTTTCGAGTTTTCGCTATGAGCTGATCTGTGTTTCCAAAGAGAGCTAAGAGTTTTCAGCTAA
AAGAGGGAATTAGTGGGTAAATCAAGGCAGCTGACATGGGTGTGGCTGGCCCTTGAAATGTGTCTCACTCTCTGTGCCCCAGGCAGAGCAA
AGATAAACTCCAGACTGCTGTCTCAGAGAACAGGACCAACGTCATAGGGCGCCTFAAAAGGCAGGTGGCCCACTCTGTGCCCCAGGCAGAGCAA
GGTCTGACCTGCTTGGACAAAGTGTCTGAGTACATAGTAAGGATGGATTGGCTAGTCTCTCAAACTTGCAAAACAGGGCGCAGGTGATCTTT
GAGATTTCCAGGTGCCGGAGAGACCCATCGTGTAGATTCCAGAGTTGGCTATCATGACTAACAGCTGTCTAAGTTGTTTAAATGAATC
ATTAAGGGCTACATTTTTCAGTTTCAGCTAAATCAAGTAGCAAAATTAACGGTGGGTCTAAATACTTATCTATGTGCATTTATGTATATGCTAGA
CTTTATCACTTTAGTTGGTTATATCGCTTTTATCTAAGAGTTTACTCACTTTCACATTTGTGGCTTATAGTATTTTCAATCTAAGAGACTAA
CTGTGTAAATAACACTTTTCAAACCTGTTTATCTAAGAGTTTACTCACTTTCACATTTGTGGCTTATAGTATTTTCAATCTAAGAGACTAA
TTTTTGCTTACATAGGAAACTACATATTTTAAATTGAAAAATTAAAAAATATTTTAAAGGTTTAAATGAGTCTCTATCAAAACACATTTGT
ATATAGGAAGGTAGCCCAAGGTCACTGTTGCCAATTGTGTACACAGCCTGCCCTTTAGTGTCTTCTTCTAAACAGCACCAAAATTTTGA
TCATAGTTGTAAATCTCAAAATGTTGGTTAAATAGGATTAACACACTGTGTCTATCAAAATTCATAGGACACAGCTAAATCCCTGACACGGGA
TGAAAAATTAAAGCAGAGAAAACGAAAGGTCTCTCCAGAAAGCTGTGGCAACTTCACTGGGGGAGTATTTGCAAAAGTTAGTGTGTAATAACA
CTATATTAATAAAGTTTTTGTAAATAGAGTAATGATAGAAAGAGATTAGTTGAAATGATGTATGTAAAAATGTGATAAAGTGCATAA
TTACTAGTACAGTTGCTAGTTTACGACTGTATTTAAAAAGACATTTCCAAATGTTGATCAAAATAATGGAGGTTTCTGTGGTTGTTTCTTTT
TTAAAAATAGTAAATATACGTAAAGCAGATAAATATCCCTTTTGTGGGAGTTAAAAATAATCTAACTTATTTATAGTTTAACTTTTATTA
AAGCATACGACTATTCTAACTTATTTTAACTTTTCTTAGTAAAGTTTAACTCTGTATTTTAGAATATTTGTAACTAAATGTGTATCGAAT
TAAACTCAAAAGGGAAATTCATTAAGTGAAGAAAAATTTTAACTGTGTCACTATTTCACATAGCATAAATGGGTTTTTATATAGGAGTATGA



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FIG. 3R

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FIG. 3S

AGCAGGTACAGTCAATTGAAATAATGTCTGTTCTTACACAGATCTGGACCGAGAAATACCTGCACCTTGTGTAGTGGGATTGATGAAATTACTT
ATTTTCTTATGTAATAAATTTTCATGGGTAGCTGCTTTTATTTTGAGGAAGAGTTTAAGGGAAGCTTCAGATTTCCTTGAAGNACATATTT
CGTGTAGGATAGGCTTCTGCAAGACTCCAAACCCGGAATCTGGGGGATTCATCTCTGTTTAAAGTGTGCTTTCTCTCAAAAATAGATTATTC
TTGGTCTCTTCTGAGTTAGGATATTGAGTCAAAAGTATTGGAAGAGTTTLLLLLLTAACTAGATCAGTGGTCTCCAGAGTTTGTGTTTT
TTGTTTTTGTGTTTTCTGTTTTTGAGACAGAGTCTCGCTCTGTCAACCCAGGCTGGAGTTGATCCCGCTCATTTGCCAACCTCCACCTCC
TGGGTTCAAGGTGATTTCTCTGTCTCAGCCTCCCTAGTAGCTGGGATTACAGGCTCTTACCAACCGCTGGCTAATTTTGTATTTTTTA
GAAGAGACGGGGTTTCAACCATGTCTGGCCAGGCTGTGTCOCGAACCTCTGGGCTCAAGTGATCCACCTGCCCTCAGCCTCCCAAAGTCTGG
AATTAAGGCAATGGACCAACCGTGTCTGGCCAGAGATTTTGTGTTCTCTCATTCCTATGACTAAAAAATTTGTTTACCACTCACTCTCTAAA
TATATGCATATTTCACTCATGAATTAGATACATGAATTGCTACCAATGATATCTCAAGGCACAATAATGTAATTTAAGGTGAGATTCA
TCATTAGCGAGTGTGGATATAAGTCCACATTTCAAAATAATCTCTAGATATTTTGAACCTTTTAGCCGACTTGCCAGATCTGATTAGAT
CACCATAGTTTTTCCCTGTCTCACTTGGCCAAATAAGAGCTCATATAATGATCAAGTGTCAAGCTCTGCCATTTGCTTTTGGTCCCTTGAGCT
TAAATTAATTCATTTTAAATCTGCCAAAGTTTTTTTTTTTTTTTCAAAAGAACTCTTGTTAAGCCCTCTCTGCCATTTAGTGAAGTTACTTTA
GTTAAACTAGATAATAAATCCATCAGTCTACCTGAGTCTCTTACATGGCAACTCATTAACAATTTGGGTGCATGTGAACAGAGCAAGG
GAACTATAGTTGATTTCTTCTGGAATGTAGAGGATCCCTTTTCCCAAGGTCACTCAGATACAGTTGGGCACACACAGTATCTGACATAT
GCATCTCAAGAGAGTAOCATGTATATCCAAATAATGCATCAGCCTTAATCACTTTTCAAAATTTCAAAATAGCTTTTATTTAACAGCTATAGCT
TGAACTACATATTTTATCCATGGAGAAATACATATTAATTCAAATGTCTTTGGAAAGATGTAAAAAATTTGTTTCATATGCCACAGTATAAA
GTTCAGTAAATTTCTAAATATATAGACATTTGAATAGCTTGCAGTTTAAAGACATTAATAATTAACATCACACTCAAAAACAATGACTTTTT
TAAAAAAGGTTATCTTCAAMCAATMCCCTTAAATCAAAAGAGGAAATTAATAAAGTGTAAACAAAAATAATTTGGAAAAATATTTTCAATTTTA
ATGTTGAGAGTAAATTAATTTTTTAAATKTATTTTTTATTTTTTTTGAAAAATGTAAAGTTGTAAATACATATTAACAAATTTACCATCATTA
ACCAATTTTTAAGTGTAAACGTTTCAGTGTAAATACATTCATATCTGTGTGCAACCAATCTCCAGAAATTTATTTTCATCTTGCAAAAAC
TGAAAGTCTATACATATTAACAATGCCCAATTTCCCTCCCACTCAGATTTTTTAATTTTAAAAATAACAAGTGGAAAGTTCTAATATTTT
TCTATCTATCCCTCTATCTATAAAGTTGGGGGCCACTGAATTCAGATTTGCTGTGCAATCTTTTTTACTCTGAGCATCATGGCCTCTG
GGAGTCCGTTAAGCAACTGGAGCCGGGTAGTGTAACAGGCTGAACCCCAAGGCTGTGTGTCTCAGCGTCAACCGGACTGGTTGATGTTGCAGC

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FIG. 31

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CTCACCTACTGCCCTGAGTCAGTCAGGGTTCTGGCAAGGAAGGAGAAATGCCCTGACAGCAGCTGCAAAACCCCTTCTCCCTTTTGGCAGC
AATCAAAAGATTTTGAGGAAATCTAAATAGCTCTCATCAGGAAATGTGGAAGCCCTCCAGCTGGGATCTTCCCTGGTGGCTTGT
GAGCCTGGCCATCTGGGAATAGAGACACTAGATAGCACTCATACACTCTTCAAAAACACATTAATCAGATGGAATGTTTGAACATCTG
GGTAAACCACTACTTTTCAATTTATAGCTAAGAAAACCTGGGTTTGAGATGTTTGTAAATTAACATGTTACTCCACACTGTAATGAATG
AACTGAGATAAAGTCAGCAGATGTGTGACCGGGGACCCAGTGATTTTCTGCTTTTCTCACTTCCCTGAAACCTCCTGGCAAGGAGGACA
GGGTATACAGCTTTAAACAAGAAATATCCCACTTTGGGTGGTCAAGTAAGCAAAATGTGGATTTCACTTCTGGCCCTGAAAGNAATCCAAAGCA
ACTAGTAGAAATTTTGTGTTTATTTCTTAAATCTTATTGTACAAAATTCATTTGAATTTATCTCTTAAAGTTTGAGGCACTCAATTAGAAA
GTTAATCGGAAAAAAATCTGTTTAAACCTGAGTATCCCTCCCTAAATTACTTAAGCTTAGAATAAAGGTCACTTTAGACAAAT
ATGAATTGGCAAAATATGGTGTAGCAACCCCTAGTCTCCAGTATTGAGCCCCACCCATTTCTCAAGAGTACTGCTCAGTGGTGACCCAGC
ATCTCACTGTCCCTTCCCTCCACCCCTCTTATTAATATTAGTGAGACTATCTGAAACTTATTAAGTAGGAACCCCTAGAGAAGGTT
AGAGTGACTTGACCTCCAAATCAGGTTTATTTGTATGTGTTTAAATGAAATGGGGTCTTGTCTATGTTGCTCAGGCTGGTCTTGAAC
CCTGGGCTCAAGGATCTCCTGCTCACTTCCCGAGTAGCTGGGATCAGGCACTAGCCACCATGCCCTGGCTCAATGCCAGGTTAAT
ATAGCGCTTTTGATAAACTGTCAACTATAGGAATAGAGTTATAAGCGTGAATCTGCCAGTTGGTACAAATGTTCTAGCAGGAAACGGAAAGG
CGTCGATAGGATATTCCTTAGGAATGTTTACTAGACAGAGGCTACTCTTCCATGGCAATGTTTCACTTCCCAAACTTGGGACCTGTG
ATTTGGTAACTGTTTTTGTCTCTCTGGGCACTGAATGGAAAGGAGCCCTGAGAGATAGTATTAATTAAGTACTGACTAGTTATAATA
ACAGATGCTTGGCTATGATAATGGATACTAGGTATAATAATAGATGCCCTTGTGTTTAGCTCATTTAAATGCAAAAGACCTTGAGAAAT
AGATACTATTATTCCTATTATTTGCAATAGAGGACTAAGGCTTATATGTATTAAATTTGGCCCAAGGGTACACAGCCAC
TGTAATTTGGAAATTTAGGAATTTTGGCTTATGAGGACAAATGAGCAGAAATATGTAAATTTGGGACTGATTGAGAAAATCCTGG
AGGTATGTACTTGGCTTGGAGAAACAACTTTTTTTTTTTTTTTTGTGAGACAGAGTCTTACTCTTGTGTTGCCAGGCTAAGGACAATG
GCACGATCTTGGCTCAGTGCACCTCCGCTCTCTGGGTTCAAGCGATTTCTCCTGCTTCAAGCTCTGAAAGTGGCTGGGATTAACAGGCACT
CACCATCATGACCACTAAATTTTTTGTATTTCTAGCAGAGACAGGGTTTTTACTATGTTGGCCAGGCTGTTCTCAAACTCCTGACATCAGG
TGATCCACCCGCTCCAGCTCCCAAAATGCTGGAAATTAAGTGTGAGCCCACTGCCACCTGCCGAAAAACAAACCACTTTAAGATGTTA
GATTCAGCCAAAGTGAAGTGGCTCATGCTGCAATCCCAAGCACTTTGGGAGGTCAAACCTGGGAGATCACTTGGGAGGAGGTTTGA
GNTCAGCCTGGGNAANTGGTGNAACTCCGCTCTCTANTANAACATACAAAATTTNGCCCGCATGGTGGCACCGCACCTGTACTCCACGC

FIG. 3U

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TCGTTGAGAACTGAACCTCTTTCTAGAGCAAAATTTTCAAAGCAGAAAGAAAAATGCTAATAGGTTGAGAACTTGAAAAAACCAG
TTCCCTCATTTATTATTCTTTTATTATTATTGTAACGAGTCTCACTCTGCCACCCAGCCTGGAGTACAGTGGTGTGATCTTGG
CTCACTGCAACCTCTGCCCTCCAGGTTCAAGCAATTTCTCCCTGCTCAGCCTCCCAAGTAGCTGGACTACAGTTGTGCAACCACCAAGCC
CAGCTAAATTTTTTTTGTATTTTTTAGTAGAGACGGGGGTGTCAGTATCTTTGGCCAAAGCTGGTCTCAAACTCCGACCTCAGGTGATCCACC
CGCCTTGGCCTCCCAAAGTGCTGGGATTCGAGGCTGAGCCACCAATGCATGGCCATTTCCCTCATTTATTAAAGCTCATGTAGATGCTC
AGCTCTATTCTGCTAAAGCATCAGAGAGCTTCTTTAAATTGATCTGGAAATCCTCAACTCCAGTTTGAGAAAGCCACTCTCACATATA
ACCAGAGCAATTTAGTGCCCTCCTCTGTAATCACTACAATCATTTCCCTTAAATCATATAAATGTATGCATATAAACCAAAAAAATGCTCATA
AACCCCAAACTACAGAAATATTAGATAAGAAATGCTCTCTACCAACACTAATCATGCTCATGGCATCCATGTTGGAGACACAATGCTG
CTTTAATGTTTAAAGCGGCAGATATCTTCTGTGGGCTTCTATGGAGTAAGTTAGATACCGCATTCGAGAAATGAGAAATTGCCACGAGGGT
CAAGTGTAGGATCTGCATTTCCCTTTGTGCTGTAATGACCCCTAAAGCCAGGTTGAAGGCTGCTCCCTCTGAGATGAAAAATATAAATGG
GCTCCTTCTATCTATTTTTTCTTTTTTCTTTTTTTTTTTTGTGAGATGGAGTGTGCTCTGTGTGTCAGGCTGTATTGTTGTTG
ATCTCGGCTCACTGCACCTCTGCCCTCCTGGGTTCAAATCAATTTCTCTGCTGCTCAGCTTCCCGAGTAGTGGGATTAACAGGTGCCCGCCA
CCACGCTGGCTAAATTTTTGTATTTTTTAGTAGAGACAGGGGTTTCAACATGTTGGCCAGGCTGGTCTCGAACTCTGACCTCAAGTGAT
CTGCTCACCTTGGCTTCCCAAAGTGCTGGAAATTACAAGCATGAGCCACCAACAGCCAGCCAGCCACCAACCAAGCCAGCCAGCCACTCCT
GACCTATCTGACTATTTTCAATTAATATTAGCTGTAGCTGGCAACATCTGAATCAGATTCTCAAAATCGCCATGACATTAACAATG
GCTCTACATAGGAGAGGTTTACCTTTTCAGAACTGAAGCTAGGAAACAGTGCAATTACATCTCTCAGGTGCCATCGTTCCATGAAACAGA
GAAACAGCCATCAATTACTGGAATTTGTTGGGTTCTATTTTCAGAGTCCAGTGGACTTTTTTTTTTATAAGTCAATTTATTTGGTCTGGTAGTCCAT
TCTGAGGTTGCAAAATTCATCAAAATATTCAGGATAAACACAGGCGAGTAGACTAAATCTATCCAGGCTGGTGGTATTAAAGTGAATTTTA
GCCTGACTGTTTACATGGATATCAACTGTCTTTGGAATTAACATGAGAAATATGTTTCATTAGAAACAAAGGGCTCCTCCCTCCATGTTGT
GTAGCAGCCTTACACAAGCATTTGGTTACATTTCCCATGTGCAAGGACTGTGATGATTCAGACATGCCCCAATCTAGATAAATTTTT
CAACCACTGTAAACCCCTCCACACACAGCTACGAAACATAGGTTTCCACTGTCTGCCACCAATTCCTCTCATTTACACAGCTGGGG
CCAGCCCTACTCTCAGCTGCCCTCACAGCCACCTCCCGCCCTCTGCGCCACTTCCATCTCAGTGATGACCTGGAAAGCCAAAGGTCC
CCTGTGAATGCAAAATAGTAAAGACAAAAAACAATAATAGCAACCAAAAAAGTCTGTGTTACACTATTGTACTCTTCTTCTCCAGTATCCC

FIG. 3W

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TCCCTAGCCAGACAGTACACAGAAAGCTACCGCAGAGGAGACACCTGTCTTCCCAGATGAGCAAAATGTGGACTGTATTATCAAGAATAGTC
AGGCAGGCGCTCTACAGCACTTGAATGTGGTTTCCATCACTTTCTGGACAGGTAGTTGGTGAGGAATAAGCCTACTGCCCTTAGAAAA
TCTGCCATAATGACTTGACACTTGTGAGTTTGGCCCTTGTGGTAGGCAAAATAATGACTGCCCAACAATATCCCCAACCTAATCCCCAGAA
CCTGTGAATTTATGTTATGCGGCAAGGGAAAGTAAGGATGCAGATGGAATCAATTTGTTTAATCAACTGACTTTATTTTATTTTATTT
ATTTTGTGAGACAGAGAGTCTTGTCTGTCAACCCAGGCTGGAGTGCAGTGGAATGATCTTTGGCTCACTGCAACCTCCACCTCCGGGTTTA
AGTGATTTCTCCCTCAGCCTCCCGAGTAGCTGTGATTAACAGGCACTCACCAACCATACCTGGCTAAATTTTGTATTTTGTAGTAGAGGC
AGGTTTTCGCCATGTTGTCCAGGCTGGTCTCGAACTTCTGACCTCAAAATGATCCGCCACCTCGGCCCTCCCAAGTCTGGGATTACAG
GCATGAGCCATCATGCCCGGCTCAACTGATTTTAAATAGAGAGAGTATGCTGGATTAATCCAGATGGATTCAAATGTAATCACAGGGTC
CTTAAAGTGGAAGAGGAGGCAGAAAGAAATTAATAGTAGCAGCCACAAGAGAAAGGACTTGGCTCGACTTTGACGACCTTGAAGACAG
AGGAAGGGGCCAGGAGCCGAGTAATGTAGGTGGCTCGAGGAACTGGAAATGGTATAGAAATGAAATTTCTCTCTAGAGCCTCCGCCAAAA
AACTAGCCCTACTGACATCTTT
GGTGGATCTTGGCTCAGTACAACTCCGCCCTCCTAGTTCAAGCGATTTCTTCTGCCCTCAGCCACCTGAGTAGCTGGGACTACAGGCAC
GTGCCACCAACGCCAGCTAAATTTTGTGATTTTTTTTTTTTTTTTTTTTTTTTTTTGAGACAGATGACATCTTTGATTTTAGCCTAGGGAGACCCACTTCAGACT
TCTGACCTAAAGACCAACAATAATGAATTTGTGCTGTTTCAAGCCACTGAATCTGTGGTAGCTGTAGCAGAGCTAATAATAATAGTA
ACTGACCAACATTTACTGAGCAAGTTCCGTGTGGCAACCTTCAATGGATGGGCCCTTATTTGGTCAATGATTTTAAAGGCCCAAAATTAGA
AAATAGCTAACACTGAATTAAGAACACAGGAAAGAGGAGCGGAAATAAAGAAATCAGAAATATCTTGATAAATTAATGCTATTTTT
GTTGAGTATAGGTTTCATTTTGTCTCTCATATTTCTTTTCTCTACCTTGGTCTTTCTGGACCTCAGTTCTGAAATCTGTTGAAAGCGAATPAGG
TCCAGGAAAGTAGCTCTTGGAATTAATCTTCAATTTGCTCTTATGAATCCCTGGAAAGGAACAGATGAGATTGAGTTCTACTGTAGCTTGACC
CGTGGGGGCGCCGGGAGACCTGGTCTTAATGCTGCTGCTTAAGAGAGTGTAGTTAAACATTAATTTTTCGGTGGGAGAAACAGACAGCGCAGG
TGGGAGAGTAGATGATTTAGCTCAGTGACTGCACCTGMAAGTAGCTCCCTGGAAGGGTTCTGAGGTTCTGTCAAGGCTAGACTAAGCGGAG
GTGATGGAATGTGCTGTGGCTGAGGATGGGGAATTAATGTGCTCATATGGGCCCTAGAAATTTGTCTATCTTGGTGTACATACAGGTTATTA
TCTAGATGCTAGAGATAAATGATGATTATGACACAGCCCTCTGACTTCCAGGAGCTCAGTCCAGAGAAAGGAAACAGATTAGTGAACA
ATTACATCACCATATTGTGGGTAAATGGCAGAAAGAGGTATGGAAGAAATGACAAAGATTAATAATGGCAAGACCAAGTCCCTTCCCTCAA
GAGGCTTACAGTCTAATGGAAAGAGATAAGAAAGCAACACTACATAAAGCAGGAATTAATTTCTTACACTGGAAATTTCTCACAGGGGCTA

FIG. 3X

FIG. 3Y

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FIG. 3Z

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FIG. 3AA

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FIG. 3BB

ATATAAATGTCTGAAATATCAATGAATCTCAATTAATCAAAATATTTGTTTTTAAAGTCACAGTTGCAAGGTTATATACAGAAGCATAGGTT
TTTATAACAGAGAAAAATAGACACCTTAATATACTGACCTCTTACAAAAATAGTCCCTGCTCAAGCATCCCATCTATGTATCATTTAMCATCTA
TTTCTTTCTACCCAGCTAAAATAGTTTATTAATAATCCCTGAAATGTCAAAAGTNGAATACAGAAATAAATCAGATAATACATTAAATGC
ACCTGATAATCAATATGCACCCAGATAATGGACACAGTATACATCAGATAATACAGTACAAATTCAAATGAAAAGTTTAGTGTTCGCAAGGT
AAAAATGTAAAGAAATGCTCTAATATGTCTCCCATGCTGCTTAAACTGTTATTAATAAATGCTTTTATTAATAATAATAAAGAATGATG
TAATAGGCCAGCCATGGTGGCTCATCCCTGTAATTCAGGTCTTTGGGAGGCTGAGGCAGGTGAATCACTTGAGGTTAGGAGTTTGAGA
CCAGCCTGGCCAAACATGGTGAAAACCCCGTCTCTACTAAAAATATAAAAAATTAAGCCAGGTGTGGTGTGCTACGCCAAGCTGTAGTCTCAGCTAC
TCCGGAGGCTGAGGCAGGAGAAATCGCTTGAAAACCAAGAACCGGAGGTTGCAGTGGGTCAAGATCAAGCAACTGCACCTCCAGCCTAGGTG
ACAGAGCGAGACTTTGTCTCAGGAAAAAAAATTTCTCAGTCACTCAAAAGGAAAGTGCTATTTTGAAATTTAGTATTAATTAATTTCCCTTGCAATTTCT
CTGTGTTCCCATCCACATCAATTCACCTTTATCTCTCTCAAAAGGAAAGTGCTATTTTGAAATTTAGTATTAATTAATTTCCCTTGCAATTTCT
TCCTACTCATATCATGTGCCCTATATACATATAATATATACAAATGCCGATATCATATACATAGCAATGTTTTTACAATTTCCGATTTTGTGCAATT
GTCAAATGPAGAAATTTTAAACTTAAAAACAATGCTTTCATACAGCCGGGTGTGGTGGCTCATGCCCTGTAATCCAGCAATTTTGGGAGGCCA
AGGCAGCGCGATCGACGAGTTCAGGAGTTCGAGACCAGCCTGACCAACATGTGTGAAACCCCATCTCTATTAAATAATACAAAAAATA
TTAGCTGGTCAATGGTGGCGGTGCTGTAAATCCAGCTACTCAGGAGGCTGAGGCAGGAGAAATGTTTGAACCCAGGAGGCAGAGGTTG
CAGTGAGCCGAGATCGCACCATTTGCCACTCCAGCCTGGGTGACAGAGCGAGACTCCATCTCAAAAAAATAAAGCTTTCATACAAA
CATGAAAACGGGCACATGTCTGGCTGGGTGGGTGCTCATGCCCTGTAAATCCAGCACTTTGGGAGGCCAAGCGGGCAATCACTTAAGG
CCAGGAGTTCCGAGACCAGCCTGGTCAGCATGGTGAAACCCCGTCTCTACTAAAAATTAAGCCAGCATGGTGGCATTCGCCCT
GTAGTCCAGCTACTCGGAGGCTGAGGCACAAATATCACTTGATCCAGGAAGCAGAGGTTGCAGTGAGCCAAAGATTGTGTCACTGCA
CTCCTGCCCTGGTAAACAGAGTGATACTCTGTCTCAAAACAAACAAACAAAGAAAAGAAAAGAAAATGGGCACAT
GTCAAAATGTTAAATTTGACTATGTAACTTATTAATGAAGGAACAGCAGGGGTGTAGAGCTGGGTCAAGAAAGTATAAGAGAGACTGGAG
TGCTTACAGTCAAGCAGAGACAGATGCTGAAAGGTTATGAAATTAGATATGTTAGTTAATATTCGAAAGGGCAACTAAACTGTAAATC
TTGCCATTATCTTTTCTATCAGACCACAAAATAATTTACATCTCTACTAGACAAACATTTTGCCCATTTTCAATCCCATAAATCTATGGGTAAT
TTTCAATGGAGTCTGGCCCTAATCAACAGTAAATAGTAAGCCAAACAAAGGATCTCTTCCCTAGACCTTGAAAGTGATCTTTGGGTGGACCC
CTTAGACAAATAATTTAGTATGACATTTGAGAGGACACCGCAAGCCTGGGCGACATAGTGAGACCCCGCTCTACAAAAAATAAATAATTTAG

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FIG. 3DD

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GGAGTTTGAGACCGCTGGCTAATGTGGGAAACCCCGTCTCTACCAAAAATAGCCAAAGTGTGATGGCACACACTTGT
AAJCCAGCTACTCAGGAGGCTGAGCGAGGAAATCACTTGAAACCGGAAGGAGAGGTTGCAGTGAGCTGAGATCGTGCCACTGCACT
CCAGCTGGGCGACAGAAAGGAGACTCTGTCTCAAAAAAACAATAAARACATATTGCCATCTTAAATTCACCTATACCATGACTC
CCAGATTCACTCAATAACTTTTTCATAACTGCAAGTGAATCTTCTCTAAGACATCCCCCTCCAAACACACACATTAACCTTAAT
CTACAAATGCGCCAGGCTAGTGAATCTGATGAGGCTGGTTTGGAGGTTCCAAAAAGACTTGGATACAAAAATTACTGGGCGAGAGCA
ATTGAAGATGCAATATTCTGTGTGTAGTATGTTAGGTTATGTTGGTGGCTTATCCAGATCCCTGGGATCCCTTTTACCAGCTCCCACT
GGTGTGGTGTCTGCTAACTGCTTATCTCTGAAACTTTCTCCCAAGATTGCCCTTGGAGCACTTATGCCCCAGAGCTTCTGCAAG
ATCAGGCTGAGGCTAACAGTCACTGAGGCCATATCCCTGCTTAGCTTCTTTCACCTTCTCTAGTTTGTCTTCTCATCCCTTAAAAAGT
TGCACTGAGAGCATTCCTTTATATAAACCACTTCTGTCAGAACTCTCAGGCACTGCTTCTTAGGAAATTAGACTTATGGCATTTCTATAATCCA
GCATTTCCCTCTTTTCAAACTACAAAGCTGTGGATCATGCTGATTTGAGAAATAAGTTTAGAAAGTCAAGCAAGCTCATTAATAA
ACAAATTAATAAACCATACAAAAAATAGAAATAGGACAAAGTAGAAAAATATTAGCATGCAATTGCATTTTCATTAAGTCATATGCCACATCATG
GAATTTCAATTTCCATTTTGTATGTATATGTGTAAACATATATACATATACATATAGTAGACATACGTTGTGTGTTTGAATCATGATGTCA
AGTGTATTTCAATTACTGCAGACCAAGTCAAAAGGGTTTGAAGGCCACTGTTCCTCCAGCTCTCTGATTTCTATAACTCTATTA
GATTACACTTGAGGAAGGTAAATAATTCAATATATTTGATCATCTCTGCATATATAGACTTTTAGTGTAAACGAGGAAAAAGTCTTGT
TTGAAGAATAAACTTGAAGAAAAATTTTAGCAGTGTCTTCAACCTTAGAAATCTACAGTCAATATTTAGTGTGTTTTFACCATTTGTCA
GTATTTTCTATTTCTGTGCTTTTGAATTTTACTTCCATTTCTAGTGTCTCTGAGTAAACATAACAGATTTTATCTAAATTTCTTTATGCTGATAA
CAAGGCACTTCTATATAAAACCTCCACATATAAAATAAATAATTAATGTTTTCATTTATACATTTTATTAACAATTTTACCACTTAAGAG
CATTTACTGGGTGTCAGGCAATGTTCTAAGACTTTTTCATATATATCAGATCATTTTAATACCCCTCAATGACCCCTATAAGGGAAGTAGAAT
TCTTTCCCAAGTTTTCAAAATGAGGCAAGAGGAGGTTAAGCAACTTGTCTGAGCTCACACAGCTAGTAAATGGTAGAACTAGAAATTC
AACTCAAGCAGTATTTCTCTAGAAATCAGTGAAACGTAAACCACTTTGCTAAACTGCTGTGAAAGTTTCTTTCTCAAAAACAGCTCCTATTT
CACCATGTAAAGAAAGTACAAACCCATATAAATAGCAAGTGTGAGAGAGGCCCTTATGAAGAAATATACAAAATTCACAGCAAGTGAAA
ACGGTTGTGCTCCCTGCTGTATATAGTTACATGGGTGTTGACTTTTCAATTTATTTAAACCAACATAAATACTTTATGTCAGTTTCTTA
TGATGTTTATCTACAGAAAGAGAGGAAAAATTTTAAATCAATTTCTTTAAGGTTTACATCAAGTTGCGTATCAGTTTCAAGTTCCATTT
TAAATGATTTCAAAATCAAGTCTGTGCTTTTGAGAAATTCATTAAGAGAGTAAACATATGTTTATTCATTAAGAGTAAACATAAATTTTGA
TTGATTTCTTGCCAAAAATCACACCTTACCAACCATATAAATTTGTAAATTTCTAGGAAAACTCAGTACAAAACTGGTGCAATGAATTTT



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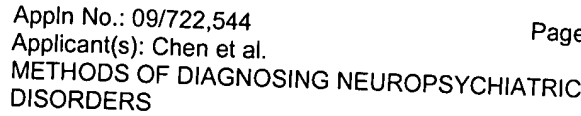
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GTGGCAGACAGTAATACTCAGCAAAACATCCACCTCCTCTCTCATATTTTCCAGCTCCCTTGTGGTTAAACGTTGCCATGTGGCAA
GTTCTGGCCAGTGAAGCGTGAGCAAAACTGAAAGGGTTCTTTGTAGATTGAGACAGTGAAGAGCCTATGTGTGCTCATCTATTTCTCTT
TTTCTGCTGAGGGCACAAGAAAGTCTGAAATCATGTGCTACAGCTATGAGATAATGTGCCCTTTGCCCTACAGGCTTCTCAGTGTTTA
CTGGTGTGGAGCCCTTGTAAATGGACACATAACATGAACAAGAAATAAATCTTTGTTCATGAAGCCCTAGGAATGCCAGGACTAATCTG
TTACCTCAGCACAAACCCAGGCCCTATCCTGACTAAGGTGGTATTAATTAATTTGAAATGTGTATTTGGGATTTTAGTAACTTCTACTGT
ATAATCCTTCTTCTGTAGGTAGTTCCAGGAATTCATGNAAGGAATAATTTCCAAACAAGATGAACAAATGATGACAGACTTAAGCATTTCT
GCCTTCTCTTAATTTCCACACTCAAGATCCCTCTTGAAGNAAGTCTGAGAGTTCTAACTTCTCATTTGGCTACGTAGTGGCAAAAGCTCTAC
AGCAATTTTAAGGNAACATTTTAAACCTGGTAAAGCAGAGTGCCCTGTAGGAATGCCCTTGTTCACAGGAATAGTTAATTTCTCAAAAGGGA
AAAAACAAACCTTGTTCAAAATAACCTGGAAACATGTTTAAACCTCATTAATAAAGACATGAACAAACAAAGATGGCATTTTCTGCCCTA
TCAGATTTTGCAAAATTAACAAACCCAGGAAATCCTGTATAGGAATGTGATGAATGGGAATTTCTCATATATATCATGTATTTGGTGGGAAC
ATAATTTGGTTTTTGCAATTTTGAAGCTATTTGATTAATGATATGAAGAGCCATAAATTTCCCTTTTGATATAATAATTTCCACTTCCGAA
ATCAATCCTAAAGGRATAAATCTAAATTTGATGAAMAKTCTCCCTCCAGATCTAGATTTGAGCATTTAATTTAAATTTAAAGTTGGCC
GGCCGCAATGGCTCATGCCGTCTAATCCAGCACTTTGGGAGGCTGAGGGGGGGATCAGAGGTCAGGAGATTGAGACCATCTCTGGAT
AACACGGAGAAACCTGGCTCTCTAATAAATAAATAAATTTAGCCGGGCTGTTGGGGGGCTGTAGTCCAGCTACTCGGGAGGCTG
AGGCAGGAGAAATGGCGTGAAACCCGGGAGGCAGARCTTGCAGTGAGCAGAGATCGCGCCACTGCACCTCCAGCCCTGGCGACAGAGCAAGA
CTCTGTTTTAAAAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAA
TGTGTAAAAACAAGAGATGATTAAGTAKATTAATGACTAAATACACTCAATAATTTTATGAACGTTAAAAATATTCAAAAAATTTAA
ATAATGACTTGTCTAACTACTTTAACNAAGAGCTTTATATCAGCTAGTCTTTGGAGGTAAATAGTATTAATCATGATTTTTCAGAAAAAGATC
CTGAGGCTCAGTGTCCAAAGGTCCCAATGAACCTAATCAGGTCCGAGGTGGTAGAGCAGCATGTGGAGCCAGTCTCTCTCCGACTCCATCA
TCACACTGCACGGCTCCCTGTTAAGATAATTTGCTCAAAAAAATGCGAGATATAAAAAATCTGGGTAAATATGATCAACCTTTAAAGAAATAAT
ACATTTTAAATTAATCATGAGACCTTTGTAGGTCAACCATCAATGTGTAAATTAAGCCAGATGTGACAGGATTTGTGGCTCTCCCTT
TACTTCTGAATTTTGGAGGCCCTTTTTTTTTTTTCTAGTTGTATCAGTCAGGCCAACCAATATCTTTTATGACATCTACTAAGTTTAGATACG

FIG. 3EE

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FIG. 3FF

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CAATGCTGCAGTACCACTTCTCTCAAAATGCTAACTGGCATTTCAAAATTTTGTAGACAGTCTCTCTCTGTGCCCCAGGCAGGATTCAGT
GGCATGATCTCGGGCTCAGCGCAACCTCCACCTCCAGGTTCAAGCGACTCTCATGCCCTCAGCCCTCCCAAGTAGCTGGGATTTACAGGTGT
GCACCACCAACACATTGGCTAAATTTTGTATTTTGTAGAGATGTGTTTTACCATGTTGGCCGGCTGGTCTCAAACTCCTCGGCCCTCA
AGTGATCCTTCCACCTCAGCCCTCCCAAGGGCTGTATTA CAGGCATGAGCCACTGCCCTGGCATTTCAATTTTAAATCTTCA
GTAATAAATGAATAATTTTATTTTATTTTATTTTATTTATTCATGAGATAAACAATTTTCCAAAGTTTGTGTTTACTG
ACTGAATTTCTTTTGTGCACTTACTTTGGTATCATGGATAAATTTTGTCAATTTTCTGATTTATATCAATGCATTCAGGGTCCCAAA
CCTGCCAAAGTTTAAAGAGAAAGATACCTAAGGGGAAAAACCAGGAAAGATGGTAGAAAAAGAAATCACCCCTGGCATTTTCAATCACCGTAAA
CAATTGCTAGGTGCCCTAGCTGCAGGTATACAGCTCACTGAAACATGAATTTCCAAATTTTATAGGGTGAAATATATATTTAGAAACCTCT
TCTGGAACTTTCTCTAGTTATCTAGCATCTCTAAGTGCCTGGAAGTCTCTGATTTGGTATGTGTTTATTTCCCATCCCAAGTT
TCATAGCTGCCGGCCCTGGGATCTACAGTCAAGGCTGTAAACACAATATCTTGCAATCTCTGAGTCTTTAATAAGCTTTTGTAGATGGG
CTCTTACCATCATCATCTGTGAAGGCAAAATATACAAAATTTGTGACTAATGTAATGAGTCAATGAGTAAAGAGTTTACTGACCA
AACACTACGTGCATGTAGATTTCAGAAATAACACTTTATTTATCATCAGAGGAAAGAACCATCTTTAGAGGCTCAACAAACCCAGGAAAG
CTGTGAOGATTTCTTCAAAATTTGTTAAGAAATATCCATGCTATATGGGTTTTCACATTTTGTGCTACACACAGTACCAATTTTCCAAAGC
CAACAGCAGGTATTTCTATTAATCCATCTGGACTTTTACTCCAAAGAAATAACACTGAGTCTGTGAGTAAATTTATTTAGTATTTTGTATCA
TTGCTGCTTTTATTTTAAAGGTAAAGAGATCTAATGCTATCTCTAATCCAGTAAAGTAAATTTATCTCTCTCACTCTGGGACCTGGAA
ATCTCTGAAATAAAAAGGATTAATGCAATAAACACAGTTTGCAGGAAAGTATGTTAGCTATATATCTATAGTAAATATGTAATTTACTTATG
TTGAAATGGCTTAGCTATTAATCTCAAAATTTGAGTTAAATGMAAATTTCTCTCTTAAATAAATCAAAACGTAATATGTAATTTACATTTTCATGG
TACATTAAGTAGTCTTTTGTATATTTGAAATAAATATCAATCACTAGGTGCTATGTTCTATCAATCTACAAACATGTCACTTCTTAAT
TAACAAATGTTCTTCTTCTTTAGTTTCTTTTGTGCACTTAAATATATATATATATGACTTTTGTGAAATAAATCTAAGATTCATTTGCTTTG
TTTTGTAAAGACCAATAGGTTCTGTATAGTCTTTTAAATTTGTGGTAAATACACATGGCATTTAATTTTACCATTTTAAACCATTTTAA
AGTGCAAAATTTGTGGCATTAAGTACACTCAGTTGCTGTGCAACCATCAACCGTCCATCTTTCAGAGAACCTTTTATCTCTCTTAAACT
GAAACTCTGTACTGTTAAGCACTCACTTCCCGTTTCCCCATCCCCAGCCCGTAGCAACCAAGACTGTACTTTCTATGAATTTGACTA

FIG. 3GG

FIG. 3HH



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TGGTAGTACCAATAAATAATATATCAAGTAACTGATTGACTCTCAAAAACGTTAATTTTCTGCTTTTACCT
AAGTTTACCTACATGTTGAAATTTGTAAAGGGAAGGTTTTCTAGACCAATAATTTTCAAAATATTTTGTCTCTCATACTTCCCTCAAAGG
AAACTGAATAAAGTTGCAACATACCTTGCAATGCTATATTTTCTATATAGGTGAAAGAAATAGCAAAATGTTTATTTTCCACGCAATCGTAAAG
ATTAGCAGGTATCCCTCTTTAAATGTACCAAAATGGAATCTAAATATCATCGCAATTTGACCCAGCATCATCCATTTTAAACAAATATA
CAAGTTTTCTTTAAACAATGAGAAATTTTATCTCAATTAATTTTCTCCCTAAACCTCTTATTTCAATCTACATCTCTAAGAAATTTTATCC
TAAATGTAATATATTTTATGCTTAAATATCTTTTGTGATCAACACAATTTTGTGATCAATTTTAAATTTTAAATAATTAAGAAACATCTCTGT
GACATCAAAATTTCTAGGTATGAAATATTTTATTTCTAGATTGGGTGATCATTAATAATTTTGTGATCAATAATTTGATCAAAAATAACATAAA
TATATCAAAAATTTCTATGACTACTAAACATATAAAGTAAATAATTTTAAACAAATATATCTCTTAATGAGAAAGGAGAGCTTTTATATAC
TCCAAATAAGTTAAAGTATCCACTAATAATTAATTTCTTCTAGAAACAAAGACAGGATTAAGCATCATGACCGTCCCTATTTGGGGGATG
TTTTTATAGATGCAAGCACTGTGGCACCTACTGTTATATAATGCACTGCTGATTGGAATGTTCTTTTCCAGATCTTTCCCTGCTGCTT
TCTTCCCACTATTTCAGGTCTCAGCTCAAAATGTGACTTCTCTCAATGAGGCCCTCCTGGTGTATCAGATCTAAAGCACCTCTPACACAAATCAC
TGTATTAGTGTATACCATTAATTTACTATCATCATCACAATGTCTCATCTGCGAGATGCTCTGTTTGGTTACTTTTGTGTGTTTGTCTCAC
TGCCAGAAATATCAGTTCTATGAAGAAAAGGGCCCTTGTCTATTTTGACACTTATAGANATGATGNAGGNAAGACATACAAATGGCCAAATG
GGCATATGGAAAAAAGCTTGACTTCAAGAGTACTNATGGNTATNACCAACAATTTATGGAGTAACTACTTTGAAAAAGAACCAATCTCTCT
TTACTATCAAGCCAAAGATACCTCAAGGAAGGCAGCAGAAAGTGGAAAGCTCCATGTGGGCAGAGGAGCCCTAGTCTTTGAGATGTGATTTAGCT
GGTATTTGGGTGAAACAAATAAACAGCCCTCAAAATAACACAAGGGGCCGGGTGCAATGGCTCAGCCCTGTATCCCAAGCATTTTGGGAG
GCTCGAGGCAGCAGATTACTTCAGGTGAGGAGTTGAGAGACCAAGCCCTGGCTAACATGGTGAACCTCCAT

FIG. 3II



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HKNG 1mRNA EXPRESSION IN NORMAL BRAIN

BRAIN REGIONS	GRAY MATTER	WHITE MATTER	NEURON	ASTROCYTES	OLIGODENDROCYTES
FRONTAL CORTEX (1)	+++	-	++	-	-
MOTOR CORTEX (2)	+++	-	++	-	-
PARIENTAL CORTEX (3)	+++	-	++	-	-
OCCIPITAL CORTEX (4)	+++	-	++	-	-
HIPPOCAMPAL FORMATION (5)					
CA1	+++	-	++	-	-
CA2	+++	-	++	-	-
CA3	NA	NA	NA	NA	NA
CA4	+++	-	++	-	-
DENTATE GYRUS	++	-	+	-	-
SUBICULUM	+++	-	++	-	-
PARAHIPPOCAMPAL GYRI	+++	-	++	-	-
CAUDATE/PUTAMEN (6)	+++	-	++	-	-
GPI/GPe/PUTAMEN (7)	+/-	-	+/-	-	-
GPI	+	-	+	-	-
GPe	+	-	+	-	-
PUTAMEN	+/-	-	+/-	-	-
AMYGDALA (8)	++	-	+	-	-
THALAMUS (9) MEDIAL	++	-	+	-	-
SUBSTANTIA NIGRA LEVEL (10)	++	-	++	-	-
SNC (SUBSTANTIA NIGRA PARS COMPACTA)	+	-	+	-	-
SNr (SUBSTANTIA NIGRA PARS RETICULATA)	+	-	+	-	-
RED NUCLEUS	+	-	+	-	-
3rd CRANIAL NERVE NUCLEI	+	-	+	-	-
SUPERIOR COLLICULUS	+	-	+	-	-
UPPER PONS (11)	+	-	+	-	-
LOCUS CERUFEUS	+	-	+	-	-
PONTINE NUCLEI	+	-	+	-	-
LOWER PONS (12)	+++	-	++	-	-

FIG. 4A



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HKNG 1mRNA EXPRESSION IN NORMAL BRAIN

BRAIN REGIONS	GRAY MATTER	WHITE MATTER	NEURON	ASTROCYTES	OLIGODENDROCYTES
LOCUS CERULEUS	+	-	+	-	-
PONTINE NUCLEI	+++	-	++	-	-
RAPHY NUCLEUS (MIDLINE)	++	-	+	-	-
MEDULLA (13)					
INFERIOR OLIVERY NUCLEUS	++	-	+	-	-
12th CRANIAL NERVE NUCLEI	+	-	+	-	-
NUCLEUS AMBIGUUS (MULTIPOLAR LOWER MOTOR NEURONS)	+	-	+	-	-
CEREBELLUM (14)					
PURKINIE CELLS	++	-	++	-	-
GRANULAR LAYER	+	-	+/-	-	-
MOLECULAR LAYER	+	-	+	-	-
TEMPERAL POLE (15)	+++	-	++	-	-
CINGULATE CORTEX (16)	+++	-	++	-	-
ANTERIOR THALAMUS (17)					
SUBTHALAMIC NUCLEUS	?	-	?	-	-
VENTRAL ANTERIOR N. (VA), VENTRAL LATERAL N.(VL)	++	-	++	-	-
HIPPOCAMPAL FORMATION (18)					
CA1	NA	NA	NA	NA	NA
CA2	NA	NA	NA	NA	NA
CA3	+++	-	++	-	-
CA4	+++	-	++	-	-
SUBICULUM	+++	-	++	-	-
PARAHIPPOCAMPAL GYRI	+++	-	++	-	-
CERVICAL CORD (ROSTRAL POSITION)	+++	-	++	-	-
ANTERIOR MOTOR NUCLEI	++	-	+	-	-
SENSORY NUCLEI GROUP	++	-	+	-	-

FIG. 4B



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FIG. 5

PEDID	SUBID	PHENOTYPE	NT CHANGE	AA CHANGE	EXON(RENAMED)	COMMENT		
30124	3010189	SCZ	AGA->ACT	Arg331->Thr	8 (8)	BOTH AFFECTEDS		
	3010185	SCZ						
30105	3010027	SCZ	ATT->ACT	Ile23->Thr	1 (3)	THE ONLY AFFECTED		
31102	3110014	SCZ	GAA->AAA	Glu202->Lys	5 (7)	BOTH AFFECTEDS	ALSO IN CR BPI	
	3110003	SCZ						
30120	3010155	SCZ	SAME	SAME		ONE OF THE AFFECTEDS		
30126	3010203	SCZ	14 BP INSERTION	SPlicing	8 (10)	BOTH AFFECTEDS		
	3010210	SCZ	21 BP 3' OF EX10					
			GAATGCCTGGTTAGAG					
30140	3011486	SCZ	24 BP 3' OF EX6		4 (6)	ONE OF THE TWO		
32301	3210041	SCZ	SAME			TWO OF THE THREE		
	3210051	SCZ	SAME					
30120	3010155	SCZ	CTG->CTA	NO CHANGE	2 (4)	ONE OF THE TWO AFFECTEDS		
32200	3210104	SCZ	SAME	SAME		BOTH AFFECTEDS		
	3210009	SCZ						
32304	3210489	SCZ	2 BP DEL OF T's	?	9 (11)	ONE OF THE TWO AFFECTEDS		
			3 BP 5' OF 3' UTR					
32312	3210775	SCZ	SAME			ONE OF THE TWO		
30138	3011346	SCZ	SAME			ONE OF THE TWO		
							WILL SEQ.	

POLYMORPHISMS SEEN IN EXT1, 2, 3, 4 LOOK LIKE COMMON VARIANTS NOT INCLUDED HERE